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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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January 10, 1994

Mr. James E. Rasmussen  
U.S. Department of Energy  
P.O. Box 550  
Richland, WA 99352

Dear Mr. Rasmussen:

This letter transmits Ecology's comments on the Nonradioactive Dangerous Waste Landfill (NRDWL) Closure/Postclosure Plan of August 30, 1990. The Closure/Postclosure Plan was reviewed for compliance with the closure and postclosure requirements of the State Dangerous Waste Regulations (Chapter 173-303 WAC). 10580

Several changes in the assignment of Ecology Unit Managers for this project has resulted in a delay in the issuance of this Notice of Deficiency (NOD). I apologize for this delay and hope that issuance of this NOD will begin to get this project back on track.

It is important to note that additional review of groundwater monitoring sections by Ecology hydrogeologists needs to be performed to complete this NOD. The latest reorganization of Ecology's Nuclear and Mixed Waste Management Program has left us needing additional time to perform an adequate review of the groundwater portions for this NOD. As soon as these portions have been reviewed and comments assembled, we will forward them to you for incorporation into the NOD process. I anticipate that our reviews may be completed by mid February.

Thank you for your patience and cooperation on this project. If you have any questions, please contact me at (509) 736-3022.

Sincerely,

*Casey O. Ruud*

Casey Ruud  
Nuclear & Mixed Waste Management Program

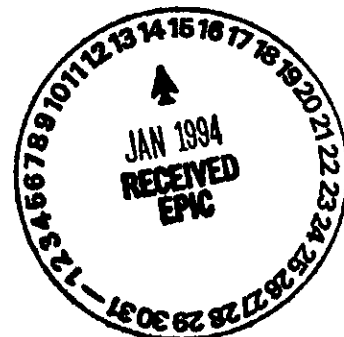
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Enclosure

cc w/enclosure:

Bob McLeod, USDOE  
Doral Hoff, WHC  
Dan Duncan, EPA  
Administrative Record

cc w/o enclosure:

Randy Kreckel, USDOE  
Fred Ruck, WHC



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**DEPARTMENT OF ECOLOGY  
NOTICE OF DEFICIENCY FOR  
THE NONRADIOACTIVE DANGEROUS WASTE LANDFILL  
CLOSURE/POST CLOSURE PLAN**

<b>#</b>	<b>Page/Line</b>	<b>Comment</b>
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1.	N/A	
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1.	N/A	<p><b>General Comment:</b> Since the issuance of this closure/post closure plan (C/PC) on August 30, 1993, many significant changes have occurred and new information has been realized that was not known at the time the C/PC was issued. Therefore, the C/PC needs to be brought up to date incorporating this new information. Examples of significant new information includes the results of soil gas analysis, and contamination found during drilling of two new NRDWL groundwater wells. This new information impacted Ecology's evaluation of the proposed closure strategy.</p>
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In letter #91-ERB-225 from the U. S. Department of Energy (USDOE) to the Washington State Department of Ecology (Ecology) dated January 9, 1992, USDOE stated that closing the landfill in place was the most viable option for the closure of NRDWL. This document states in part, "The action plan, risk assessment, and other support data were used to develop the current NRDWL C/PC which was submitted to Ecology on August 31, 1990 . . . . The risk assessment completed for the NRDWL indicates no danger to human health in its current condition. Therefore, a potential system failure (which would be very unlikely) of the proposed landfill closure system would have very little or no impact on human health and safety." The risk assessment referred to is still in draft format and has not been finalized. The first paragraph of the draft risk assessment states, "All the identified risks are potential rather than actual because, with the possible exception of minor gas evolution, no migration of contaminants from the landfill has been detected." Contrary to this claim, draft soil gas analysis and Westinghouse Hanford Company (WHC) Supporting Document #WHC-SD-EN-DP-055 rev. 0, Borehole Completion Data Package for NRDWL Facility Monitoring Well 699-25-34D and 34B identify, outside the NRDWL boundary, the presence of heavy volatile chemicals such as carbon tetrachloride which appear to have originated from the NRDWL.

It appears that capping the landfill will not preclude volatile chemicals, such as carbon tetrachloride, from exhibiting their natural tendency of dissipating out and downward, therefore allowing escape from the landfill into the air, subsurface soil, and the groundwater.

The risk assessment states, "Most wastes at the site were disposed in containers, and all wastes that are liquids under normal environmental conditions were deposited in, or surrounded by, an absorbing solid material. For the purposes of this risk assessment, no liquid waste materials were considered to be present in the landfill." Ecology could not verify that liquids were always absorbed. See comments below for specific examples.

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The risk assessment indicates the only persons potentially affected by any gas release would be the workers at the Solid Waste Landfill, and the only humans potentially affected by contaminated groundwater would be the workers at the WPPSS Nuclear Plant #2. This risk assessment and the C/PC do not discuss the new plans to release large areas of the Hanford site for public use. The risk assessment assumes that no waste is leaking at the time of the report. New information reveals this to be inaccurate to date and therefore invalidates the assumptions of the risk assessment as it pertains to impacts on the Columbia River.

Contrary to the requirements of the 40 CFR 264 Subpart N - Landfills, which became effective January 26, 1983, waste was improperly disposed of to the NRDWL without providing a liner required to protect against migration of contamination out of the landfill to subsurface soil or groundwater. This practice was continued for approximately two years in direct violation of the state and federal regulations. This noncompliant behavior, combined with lack of adequate documentation for exact disposal activities, reduces Ecology's confidence in the proclaimed disposal practices used to conclude the waste will remain on site if allowed to close the landfill in place.

This new information, combined with close review of associated documentation regarding the disposal of waste at NRDWL, and assessment of specific details included in the C/PC resulted in Ecology's failure to accept the proposed strategy. Based on the information available at this time, Ecology concludes that closing the landfill in place does not adequately protect human health and the environment. The specific details for this rationale will be provided in the comments for the specific applicable section of the C/PC.

If additional information is available that can provide confidence of proper protection of human health and the environment, Ecology may consider the following options: 1) stabilizing the waste in place, 2) capping the facility, and 3) providing vadose zone and groundwater monitoring and extraction capability.

**THIS DRAFT NOD DOES NOT INCLUDE REVIEW OF GROUNDWATER INFORMATION AS IT PERTAINS TO SECTION 5.0 OF THIS C/PC PLAN.**

**Requirement:** Rewrite the C/PC Plan to incorporate clean closure of the NRDWL site. Evaluate all the new data available, the comments below, and the future land use into the revised C/PC Plan.

2. 2/47

This paragraph states the site was operated by Rockwell Hanford Company, it should state Rockwell Hanford Operations.

**Requirement:** Correct the C/PC.

3. 2-3/1-12 Review of disposal records does not verify the location of waste per trench. For example, disposal record #000083 recording the excavation of trench #19-N, indicates drums were not located in the appropriate trench.
- Requirement:** Confirm the accuracy of disposal records. In addition, provide evidence verifying exact location. If there is no evidence to substantiate the exact location of the waste per trench, the C/PC should be revised to reflect this uncertainty.
4. 2-3/44-45 Where is the evidence to support the conclusion that a landfill operator supervised the placement of waste?
- Requirement:** The accurate level of confidence should be specified in the C/PC. Provide any evidence of operator's certification, if available.
5. 2-4/43-45 No longer are personnel required to be cleared.
- Requirement:** Clarify in the C/PC the new security policy for the site.
6. 2-4/46-47 Does Hanford Patrol still perform routine surveillances of the NRDWL site?
- Requirement:** Specify the surveillance schedule, if surveillances are no longer performed address this in the C/PC.
7. 3-1/20-21 This sentence refers to Solid Waste Engineering which is an organization in Westinghouse Hanford Company (WHC) which was not in existence until after June 1987.
- Requirement:** Was this same organization in existence for Rockwell and ARCO? If this cannot be substantiated, the paragraph should be revised to reflect verifiable historical knowledge. It cannot be assumed that the same type of environmental oversight was provided prior to 1987.
8. 3-1/30 How do we know compatibility and segregation took place?
- Requirement:** If the only knowledge is the memory of an operator, then it should so be stated, otherwise, state if a specific verifiable system was used.
9. 3-1/41-46 This paragraph states the implementation of a "normal handling procedure" of absorbing liquid wastes. Is there evidence to support this or was this just a known or assumed practice? There are disposal records that reflect some absorbents were used and other disposal records show evidence that only some of the liquids were absorbed. See disposal records #000155-000168. These records show (see page #000159) item 24 was absorbed, yet items 18-23 were not noted to have been absorbed. Disposal records #000011-000018 show the disposal of butyl ether and sulfuric acid with no evidence of use of absorbent. The above two examples were taken from 1984 disposal records, therefore, it is assumed this

period of time included an increased level of compliance compared to earlier years. Also, it should be noted these records were the only ones reviewed for comparison to the C/PC.

**Requirement:** Revise the C/PC to reflect the lack of verifiable evidence of consistent use of absorbents and the possible existence of free liquids.

10. 3-1/45-46 Disposal records for many drums (see pages #000155-000168) were identified as empty yet reflect there was less than one inch of liquid in the bottom of the drum. With the quantity of "empty" containers disposed of at NRDWL, this could amount to a significant amount of free liquid waste.

**Requirement:** Disposal records should be reviewed to ascertain an estimated quantity of free liquid waste disposed of at NRDWL. for risk assessment purposes, the estimated quantity of liquids should include all containers where there is lack of evidence of absorption. The C/PC needs be revised to reflect this information.

11. 3-1/48-50 Were the disposal records reviewed to verify that incompatible waste were not placed in the same containers?

**Requirement:** Review records to identify if incompatible wastes were stored in the same container. Document the quantity and type of incompatible wastes stored together. If that cannot be determined, then address this in the C/PC.

12. 3-2/1-8 This section indicates the use of absorbent materials. Review of disposal records (see item 9 above) revealed a lack of evidence to determine that absorbent materials were adequately used. The standard disposal approval letter (for example, see disposal record #000021) states that inspection of package content and integrity will be made as required to certify waste is disposed of in the manner described in the burial analysis. There is no evidence included that verifies the type of inspection, if any, actually performed.

**Requirement:** Provide the evidence of these inspections or revise this section to clarify the lack of inspection knowledge available.

13. 4-1/42-46 Drums previously holding acutely hazardous waste must be triple rinsed. There was no evidence provided verifying that drums of these kind were triple rinsed.

**Requirement:** Provide evidence of triple rinsing or adjust waste figures to reflect potential waste in declared empty drums.

14. 4-2/12-24 How were the locations of incompatible materials determined? Disposal records provided do not specify in detail the trench for each drum or container.

**Requirement:** Provide evidence used to verify the exact location of incompatible wastes. If documented evidence does not exist, then revise this section to reflect this condition.

15. 4-2/36-37 This section states that the current inventory of waste is provided in Appendix 4A of the C/PC, and that the waste inventory was prepared from the original manifests that document the disposal of materials to the NRDWL chemical trenches. The disposal records provided to Ecology do not match the inventory presented in Appendix 4A. One date (February 3, 1984, page Appendix 4A-3) was selected to compare the inventory listed to the disposal records. Page Appendix 4A-3 lists the disposal of 20 chemicals for the date of February 4, 1984. When compared to the disposal records, there were fifteen (15) discrepancies identified, as follows:

<u>Qty.</u>	<u>Chemical C/PC</u>	<u>Qty.</u>	<u>Chemical Disposal Record</u>
6 lbs	Sodium hydrogen sulfide	17 lbs	Sodium hydrosulfite
1 lb	Sodium dichromate	6 lbs	Sodium dichromate
0	none listed	1 lb	Potassium bichromate
10 oz	1-Ethylquinelinium	100g	1-Ethylquinelinium
1 lb	Ferrous sulfate	6 lb	Ferrous sulfate
1 liter	Polyelectrolytes	1 liter	Purifloc C-31 (no info)
1 lb	Ammonium sulfate	13 lbs	Ammonium sulfate
1 lb	Aluminum oxide	2 lb	Aluminum oxide
800 g	Weldon	500 g	Weldon
32 oz	Aluminum sulfide	1 pint	Aluminum sulfide
100 g	Creosote	100 ml	Creosote*
*100 ml of Creosote equals approximately 93 grams not 100 grams			
0	none listed	500 cc	Alum
0	none listed	.5 liter	Formaldehyde
0	none listed	200g	Cupferron
0	none listed	.5 lb	Glycerin

**Requirement:** Review disposal records and correct C/PC inventories for all known dangerous wastes disposed of in the NRDWL. Also, the C/PC should be revised to clarify that original manifests are not available for all waste disposed. The C/PC should identify the actual documentation used to determine the waste inventory.

16. 4-2/41-43 Same problem as item 15, example: Sodium hydrosulfide.

**Requirement:** Appendix 4B should be revised to reflect chemicals listed in actual disposal records.

17. 4-3/15 Due to errors in inventory listings (Appendix 4A & B), quantities listed in C/PC are suspect.

**Requirement:** Correct inventory listings in C/PC.

18. 4-3/27-28 States that all other waste containers previously manifested to this trench also were removed and either redispersed. Why were drums listed as being in trench 19N not found during the excavation and are assumed disposed of in chemical trenches? See page #000120 of the disposal records.
- Requirement:** Investigate this concern and correct C/PC as necessary to reflect actual conditions as accurately as possible.
19. Section 5.0 Significant issues have transpired since this C/PC was issued that impact the validity of this section. Data provided in annual and quarterly reports indicate the groundwater monitoring program is not producing results as required by the Closure/Post Closure Plan. These issues include the lack of quality data from groundwater monitoring. Applicable reports include: DOE/RL-93-56-1 section 18, DOE/RL-93-09 section 18.
- THIS SECTION (5.0) IS TO BE REVIEWED AND COMMENTED ON BY ECOLOGY GROUNDWATER HYDROGEOLOGIST(S).**
20. 6-1/20-25 Since the issuance of this C/PC Plan, new information regarding the existence of waste in the vadose zone near the groundwater has become known. WHC Supporting Document #WHC-SD-EN-DP-055 rev. 0, titled Borehole Completion Data Package for the NRDWL Facility Monitoring Well 699-25-34D and 34B identifies the presence of volatile chemicals such as carbon tetrachloride which appear to have originated from the NRDWL. Include this and all such information.
21. 6-1/38-39 These two new wells were already installed.
- Requirement:** Revise the C/PC to reflect this new information and the fact that contamination was found during the drilling of these wells.
22. 6-1/46 The five gallon target value appears high considering the type of waste that could be released from the site without recovery.
- Requirement:** Revise the C/PC using a more conservative approach.
23. 6-3/6-22 Considering the type of wastes disposed of at NRDWL and the apparent escape of dangerous waste currently from the site does not provide adequate confidence that a cap will adequately protect human health or the environment.
- Requirement:** Revise C/PC per Comment #1.
24. 7-18/23-29 This section assumes no free liquids. This comment is similar to Comment #12.
- Requirement:** Revise this section same as required by Comment #12.

25. 7-19/1-4 If there is no hydraulic driving force for the downward movement of any contaminants, how did the chemicals such as described in Comment #20 reach 120 feet below surface level?
- Requirement:** Revise this section of the C/PC as necessary to adequately describe the actual hydraulic forces impacting the NRDWL site.
26. 7-32/15-16 The soil gas survey has been completed.
- Requirement:** The results of the soil gas survey should be incorporated into the C/PC.
27. 7-33/31-34 Evidence indicates the diffusion of organic vapors has already occurred.
- Requirement:** Revise the C/PC to reflect the awareness of organic vapors in the vadose zone.

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